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Inflationary cosmology in unimodular F (T) gravity

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Abstract

© 2017 World Scientific Publishing Company. We investigate the inflationary realization in the context of unimodular F(T) gravity, which is based on the F(T) modification of teleparallel gravity, in which one imposes the unimodular condition through the use of Lagrange multipliers. We develop the general reconstruction procedure of the F(T) form that can give rise to a given scale-factor evolution, and then we apply it in the inflationary regime. We extract the Hubble slow-roll parameters that allow us to calculate various inflation-related observables, such as the scalar spectral index and its running, the tensor-to-scalar ratio, and the tensor spectral index. Then, we examine the particular cases of de Sitter and power-law inflation, of Starobinsky inflation, as well as inflation in a specific model of unimodular F(T) gravity. As we show, in all cases the predictions of our scenarios are in a very good agreement with Planck observational data. Finally, inflation in unimodular F(T) gravity has the additional advantage that it always allows for a graceful exit for specific regions of the model parameters.

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Keywords

cosmology, Modified gravity

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